

# NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE GENERAL SPECIFICATIONS

## PUMPING PLANT *WINDMILL PUMPS*

(No.)

CODE 533

### SCOPE

These construction specifications cover the materials and installation of windmill pumping units for livestock water. They **do not** include the installation of the well.

Pumps shall be installed according to manufacturer's instructions. Pump manufacturer's recommendations shall be followed in regard to interior dimensions, clearances, elbows, valves, controls, and pump head characteristics.

### PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be public or private, overhead and underground power or communication lines, or any pipelines. The landowner/operator/contractor shall conduct their own search and discovery for utilities in order to lessen or avoid potential damages, injuries or loss of life. Prior to construction, the owner/operator should complete an OK-ENG-45 UTILITIES INVENTORY and CONSTRUCTION RELEASE to document known utilities. Prior to any ground disturbance, the installer or their representative shall call the Oklahoma One-Call System as required by State law.

### QUALITY CONTROL

Quality control of all materials and construction procedures is the responsibility of the landowner and contractor. NRCS will make periodic review(s) of the work for the benefit of the agency which will include the final construction check.

### EQUIPMENT

1. Windmill: The mill shall be complete (including oil) with sail wheel and tail assembly having automatic and hand-operated furl capacity. The mill shall be self-oiling, with replaceable bearings and parts. The mill shall be capable of delivering the required capacity at the total head shown in the construction details. The mill shall have a minimum 2 year warranty.
2. Windmill Tower: Windmill towers shall be sized and constructed according to manufacturer's recommendations and installed according to manufacturer's instructions. The tower shall be a new Aeromotor, American West, Dempster, or Fiasa tower or a tower design certified, signed, and sealed by an engineer licensed to practice engineering in the State of Oklahoma. Tower designs from engineers licensed to practice engineering in the State of Oklahoma shall be submitted to USDA-NRCS for approval prior to installation. All towers shall be installed and anchored in accordance with the manufacturer's or designer's instructions and these specifications.
3. Drop Pipe: All drop pipe shall meet NSF requirements. The drop pipe, not to exceed 2 inch nominal size, shall be one of the following:
  - a. Galvanized steel drop pipe consisting of joints of reamed galvanized pipe, threaded and complete, with long couplings having a quality equal to the pipe. The pipe shall be Schedule 40

and meet ASTM-A-53. The total pumping head shall not exceed 72% of the pressure rating of the pipe.

- b. Polyvinyl chloride (PVC) pipe shall be PVC 1120, Schedule 80 or 120 conforming to ASTM-D-1785. Total Pumping Head shall not exceed 72% of the pressure rating of the pipe. The pipe shall have threaded couplings having a strength equal to or exceeding the pipe.
- c. Polyethylene (PE) pipe shall comply with one of the following specification: ASTM-D-2239 (SIDR-PR) or ASTM-D-3035 (SDR-PR). Polyethylene (PE) pipe fittings shall conform to manufacturer's recommendations. The pipe and fittings shall have a pressure rating equal to or greater than the following:
  - i. For a total pumping head of 0 to 100 feet the minimum pressure rating shall be 125 psi.
  - ii. For a total pumping head greater than 100 feet the minimum pressure rating shall be 200 psi. The minimum of 3/16" diameter type 304 stainless steel cable shall be used to support the pump. Total pumping head shall not exceed 72% of the pressure rating of the pipe and shall not exceed 450'.

## INSTALLATION

The installation of the pump, motor, drop pipe and other pump accessories shall conform to Oklahoma Water Resources Board Rules Title 785, Chapter 35, *Well Driller and Pump Installer Licensing*, Subchapter 9, *Minimum Standards for Pump Installation*.

All components of the windmill pumping system, include the cylinder, tower, mill, and accessories shall be installed according to the tower manufacturer's or designers recommendations.

1. Alignment of Tower and Mill: Each tower and mill shall be set in a plumb vertical line over the centerline of the well casing. The Installer shall test the plumb of the installation by hanging a plumb bob from the pump rod connection of the windmill. Acceptable alignment shall be when the plumb bob will fall within the well casing, without touching it.
2. Flow Testing: After installation is complete, the Installer shall operate the pump for a period of 1 hour. The Installer shall also provide facilities for the safe discharge of the test water.
3. Sanitary Protection of Well: The installer shall protect the well during the construction period to prevent vandalism, tampering, or seepage of contaminated water, petroleum products or other contaminants into the well from the ground surface.

## CERTIFICATION

The Installer shall certify that the pump is properly installed and operates in accordance with the design needs and with NRCS standards and specifications by signing the Certification section of the OK-ENG-54 Pumping Plant Data Sheet.

## GUARANTEE

The Installer shall provide the owner/operator (with a copy provided to USDA-NRCS) a guarantee that covers all equipment, materials and installation against any defective materials or workmanship, for a period of one year from the date of completion.